

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
26 May 2005 (26.05.2005)

PCT

(10) International Publication Number  
**WO 2005/047966 A1**

(51) International Patent Classification<sup>7</sup>: **G02F 1/1368**,  
H01L 21/288

(21) International Application Number:  
PCT/JP2004/016782

(22) International Filing Date:  
5 November 2004 (05.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-386013 14 November 2003 (14.11.2003) JP

(71) Applicant (for all designated States except US): SEMI-  
CONDUCTOR ENERGY LABORATORY CO., LTD.  
[JP/JP]; 398, Hase, Atsugi-shi, Kanagawa 243-0036 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MAEKAWA,  
Shingl [JP/JP]; c/o Semiconductor Energy Laboratory  
Co., Ltd., 398, Hase, Atsugi-shi, Kanagawa 243-0036  
(JP). YAMAZAKI, Shunpei [JP/JP]; c/o Semiconductor  
Energy Laboratory Co., Ltd., 398, Hase, Atsugi-shi, Kana-  
gawa 243-0036 (JP). KUWABARA, Hideaki [JP/JP];  
c/o Semiconductor Energy Laboratory Co., Ltd., 398,

Hase, Atsugi-shi, Kanagawa 243-0036 (JP). MORIYA,  
Yoshitaka [JP/JP]; c/o Semiconductor Energy Laboratory  
Co., Ltd., 398, Hase, Atsugi-shi, Kanagawa 243-0036 (JP).

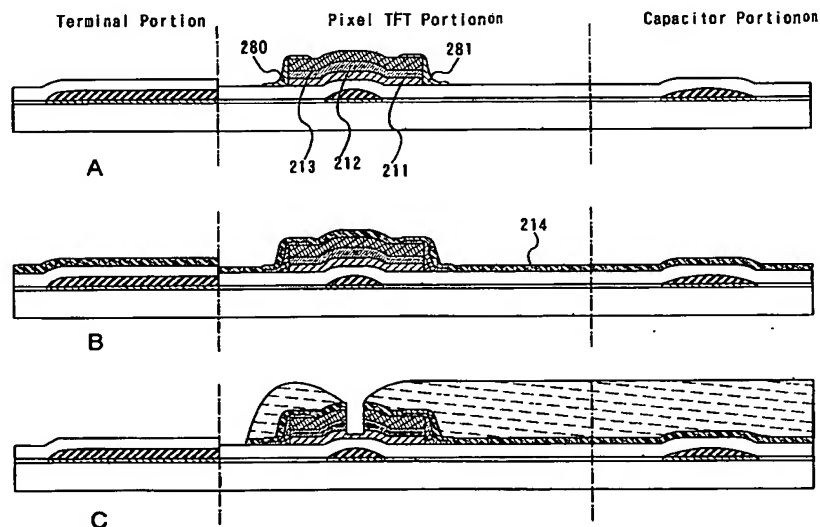
(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,  
SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

Published:  
— with international search report

[Continued on next page]

(54) Title: LIQUID CRYSTAL DISPLAY DEVICE AND MANUFACTURING METHOD THEREOF



(57) Abstract: By using one photo mask in the manufacturing steps of a liquid crystal display device, steps such as resist coating, prebaking, exposure, development, and postbaking, as well as the formation of a covering film, etching, resist peeling, rinsing, drying and the like before and after the aforementioned steps are required, which make the process complicated. To solve the problem, a channel-etch type bottom gate TFT (inverted staggered TFT) is employed to pattern source and drain regions and a pixel electrode with the same mask. Moreover, according to the invention, among the patterns required to form a liquid crystal display device such as a conductive layer for a wiring layer or an electrode, a mask for forming a predetermined pattern and the like, at least one or more of them is formed by a method by which a pattern can selectively be formed, thereby manufacturing a liquid crystal display device.



---

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*